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One Hundred Years of Medicine at Stanford



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Above: In the 1890s, physicians and nurses perform an operation at Lane Hospital, adjacent to Cooper Medical College in San Francisco.

LANE MEDICAL ARCHIVES

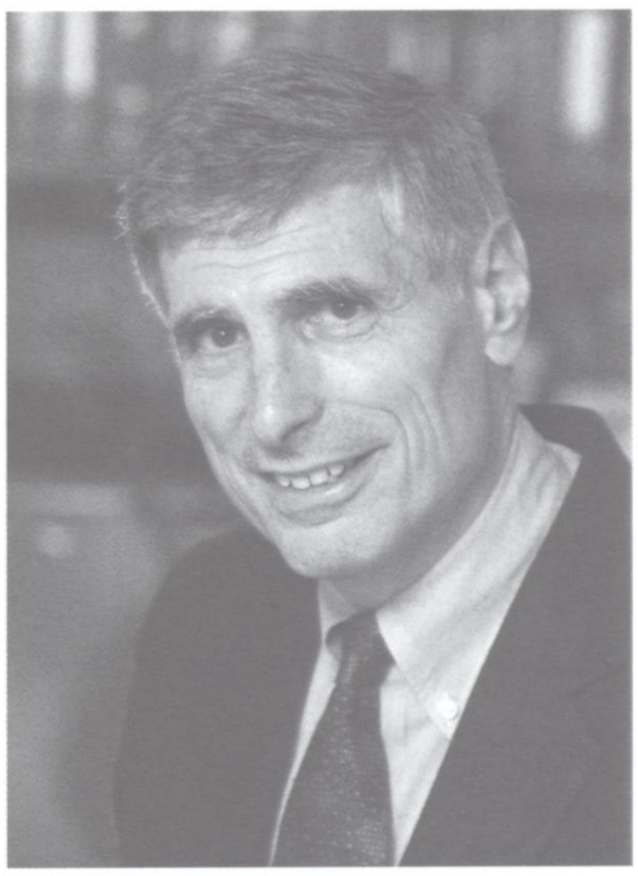
Cover: Cooper Medical College, which joined with Stanford University in 1908, was located at Webster and Sacramento streets in San Francisco.

LANE MEDICAL ARCHIVES

One Hundred Years of Medicine at Stanford

PHILIP PIZZO

Philip Pizzo, dean of the Stanford Medical School since 2001, is an internationally recognized clinical investigator, specializing in the treatment of children with cancer and HIV. Before coming to Stanford, he was physician-in-chief of Children's Hospital in Boston, chair of Harvard's Department of Pediatrics, chief of the National Cancer Institute's Pediatric Department, and acting scientific director for its Division of Clinical Sciences. The author or co-author of more than 500 scientific articles and 145 books, he has received numerous awards and honors. This article is adapted from a talk he gave at the society's annual meeting in May 2009. The sidebars are excerpted from Stanford University School of Medicine and the Predecessor Schools: A Historical Perspective *by John L. Wilson, M.D. (1914–2001), former dean of the Stanford Medical School and honorary curator of archives and special collections for the Lane Medical Library.*



L.A. CICERO/STANFORD NEWS SERVICE

Philip A. Pizzo, M.D., is dean of Stanford's School of Medicine and professor of microbiology and immunology.

People who are interested in history know that it's really the narrative story of individuals rather than institutions; the culture of an institution, too, is largely defined by individuals. That is certainly the case regarding the genesis and evolution of Stanford's School of Medicine.

In 1859, a physician named Elias Samuel Cooper founded the first medical college on the Pacific Coast, which was the precursor of Stanford Medical School. The college—originally called the Medical Department of the University of the Pacific—was located in San Francisco near Third and Mission streets. Its classes included medicine, pathology, chemistry, obstetrics, diseases of women and children, physiology, anatomy, surgery, and medical jurisprudence. Cooper had moved from the Midwest to California in 1855, and he considered San Francisco one of the best places in the country to study medicine. Nowhere else, he argued, were winds and weather conditions so favorable for dissection, and with all its vice, disorder, and disease, the city offered abundant and varied clinical material.

In truth, it didn't take much to start a medical school in America in the middle of the nineteenth century. In those days, the epicenter for science was not in the United States; it was in Europe. The

year before Elias Cooper opened his college, in 1858, Charles Darwin and Alfred Russel Wallace both presented their papers on evolution to the Linnean Society in London, and much of the action in medicine and science was happening in Germany, Italy, and France. In the United States, there were few requirements for becoming a doctor when Cooper first opened his college. Medical schools had no admissions criteria, and students didn't even have to know how to read; many who were studying medicine at the time did not. Training was based on an apprenticeship model, and medical school courses were generally short. After graduating, new physicians started their practices without much in the way of licensing or regulation.

MERGING WITH STANFORD

In 1861, two years after Elias Cooper opened his school, his nephew, Levi Cooper Lane, joined the faculty as a professor of physiology. A master anatomist and pathologist and a graduate of

When Cooper first opened his college, medical schools had no admissions criteria, and students didn't have to know how to read

Philadelphia's Jefferson Medical College, Lane was to play a pivotal role in the school's survival. When Cooper died the following year at age 41, Lane kept the medical school open, and in 1880 he moved it to a new facility, at Webster and Sacramento streets, renaming it Cooper Medical College in his uncle's honor. In 1892, Cooper was one of only seven medical schools in the United States acknowledged by the Royal College of Surgeons of England. In 1897, Ray Lyman Wilbur, who would become Stanford's third president, enrolled as one of its students.

By the 1890s, in fact, there was considerable speculation that Stanford would acquire Cooper Medical College, since the university's Founding Grant listed medicine as an important branch of academics. Although Lane intended to keep the school independent, the economic pressures of maintaining high-quality facilities and faculty proved overwhelming, and in 1908, Stanford University absorbed Cooper Medical College.

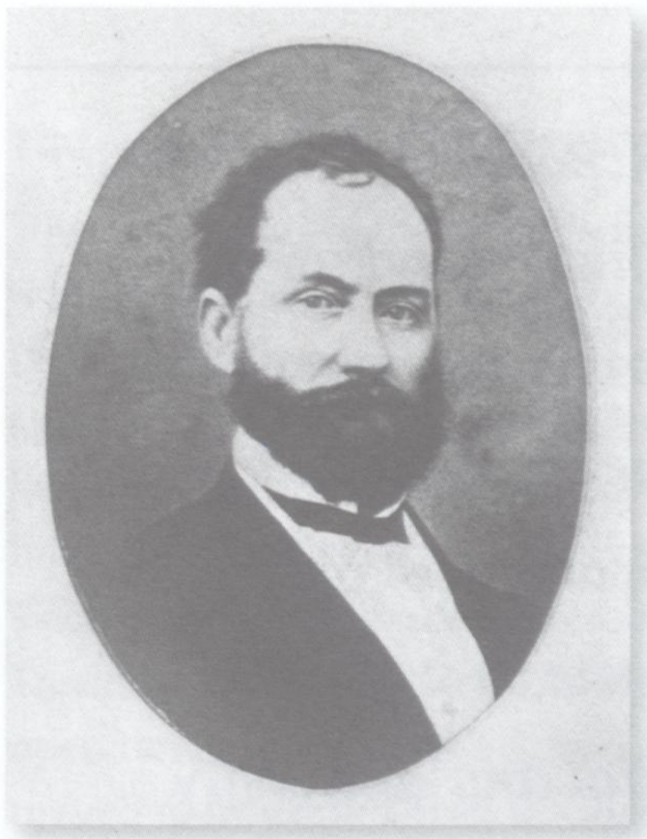
The next year, students at the new Stanford School of Medicine studied at Cooper's facilities in San Francisco as well as on campus in existing Stanford departments—including physiology, histology, embryology, and chemistry—as well as new departments of bacteriology, anatomy, and pharmacology. From the beginning, David Starr Jordan, Stanford's first president, emphasized the importance of research. Even though Jordan didn't practice as a physician, he did have an M.D. degree, as did Ray Lyman Wilbur and Donald Tresidder, Stanford's fourth president. That fact gives some context to the importance and history of medicine at

LANE MEDICAL ARCHIVES



Surgical staff at Lane Hospital in San Francisco.

ELIAS SAMUEL COOPER: PIONEERING MEDICAL EDUCATION IN SAN FRANCISCO



LANE MEDICAL ARCHIVES

Groundbreaking physician Elias Samuel Cooper (1820–1862) founded the first medical college on the West Coast, which was later absorbed by Stanford University.

Saturday 26 May 1855. On this date the *S.S. Sierra Nevada* arrived in San Francisco from San Juan del Sud, Nicaragua, bringing 664 passengers. Among them was a tall and sturdily built, black-bearded and somber-faced young man of 34 —Dr. Cooper of Peoria, Illinois. His bold and furtive plan to found a medical school in San Francisco had governed his every move for the past year and was constantly in his thoughts during the long sea voyage. Now that he had at last reached his destination on the Pacific Coast, his whole concern was to take decisive steps toward his ultimate goal without delay.

He inquired aboard ship about a hotel in the city that would best serve as a temporary base of operations and was advised to try the new Rassette House. He went there directly from the pier as soon as the steamer had berthed. The choice could not have been more fortunate. The original Rassette House was a five-story frame structure that escaped the great fires of 1850 and 1851, but burned to the ground in 1853. It was then rebuilt on a grand scale at the same site on the corner of Bush and Sansome Streets. Situated in the heart of the commercial district, the new Rassette House was an impressive edifice and the largest private building in town devoted to a single business.

One block distant, on the corner of Bush and Battery Streets, was the fashionable Oriental Hotel, where the Democratic Party was holding a political rally. Standing in front of the Rassette House on his first evening in San Francisco, Cooper witnessed a multitude of boisterous Democrats, numbering about 3,000, milling around the Oriental and marching through the streets in torchlight procession, carrying banners and preceded by music. What he saw confirmed his belief that San Francisco was an up and coming city where he could realize his ambitions…

On 5 June 1855, just 10 days after his arrival in San Francisco, Cooper rented a large house for his clinic and infirmary at 14 Sansome Street across from Rassette House, paying rent of one dollar a day. One month later, on 7 July, he opened his Infirmary and announced its special services in newspaper ads similar to the following modest item in the *Empire County Argus*, published in Coloma where James Marshall had discovered gold in Sutter's millrace in 1848:

Cooper's Eye, Ear, and Orthopaedic Infirmary
No. 14 Sansome Street, San Francisco, near Rassette House

Patients laboring under diseases of the Eye, the Ear and those afflicted with all varieties of deformities resorting to this Institution will find at once a home where miners as well as others can be accommodated with rooms in plain or costly style according to their tastes.

Dr. Cooper has visited all the important Hospitals of Europe for the purpose of extending his knowledge of Medicine and Surgery, and will give the Infirmary his immediate supervision.

N.B. All surgical operations free to patients who present themselves at the "Clinic" on Wednesdays and Saturdays.

For particulars apply to Dr. E. S. Cooper at the Infirmary.

On 5 June 1855, just 10 days after his arrival in San Francisco, Cooper rented a large house for his clinic and infirmary at 14 Sansome Street... paying rent of one dollar a day

—John L. Wilson

Stanford, and Jordan's focus on research, especially, set the stage for the school's later development.

A NEW VISION OF MEDICAL EDUCATION

In 1910, a year after Stanford Medical School began instruction, there was a critically important turning point that affected medical education across the nation—the publication of the influential Flexner Report.

Until that time, a group of university presidents—mainly Charles Eliot at Harvard and the presidents of the University of Michigan and University of Pennsylvania—set the widely accepted criteria for admission, curriculum, and graduation at academic

The Flexner Report proposed stricter requirements, high standards, and more rigorous training and emphasized the importance of having a medical school on the same physical site as its related teaching hospital and university

STANFORD UNIVERSITY ARCHIVES



David Starr Jordan, Stanford's president from 1891 to 1913, had an M.D. degree from Indiana Medical College, though he did not practice as a physician.

medical schools. The Carnegie Foundation, however, sought to evaluate the state of medical education in America and commissioned Abraham Flexner, a professional educator, to visit all 155 medical schools in the country and make recommendations. The Flexner Report proposed stricter requirements, high standards, and more rigorous training, and it emphasized the importance of having a medical school on the same physical site as its related teaching hospital and university. The report was ahead of its time in many ways. It recognized that advances in medicine and clinical care would be predicated on advances in research and teaching, and it forecast that future academic medical centers would integrate patient care, education, and research.

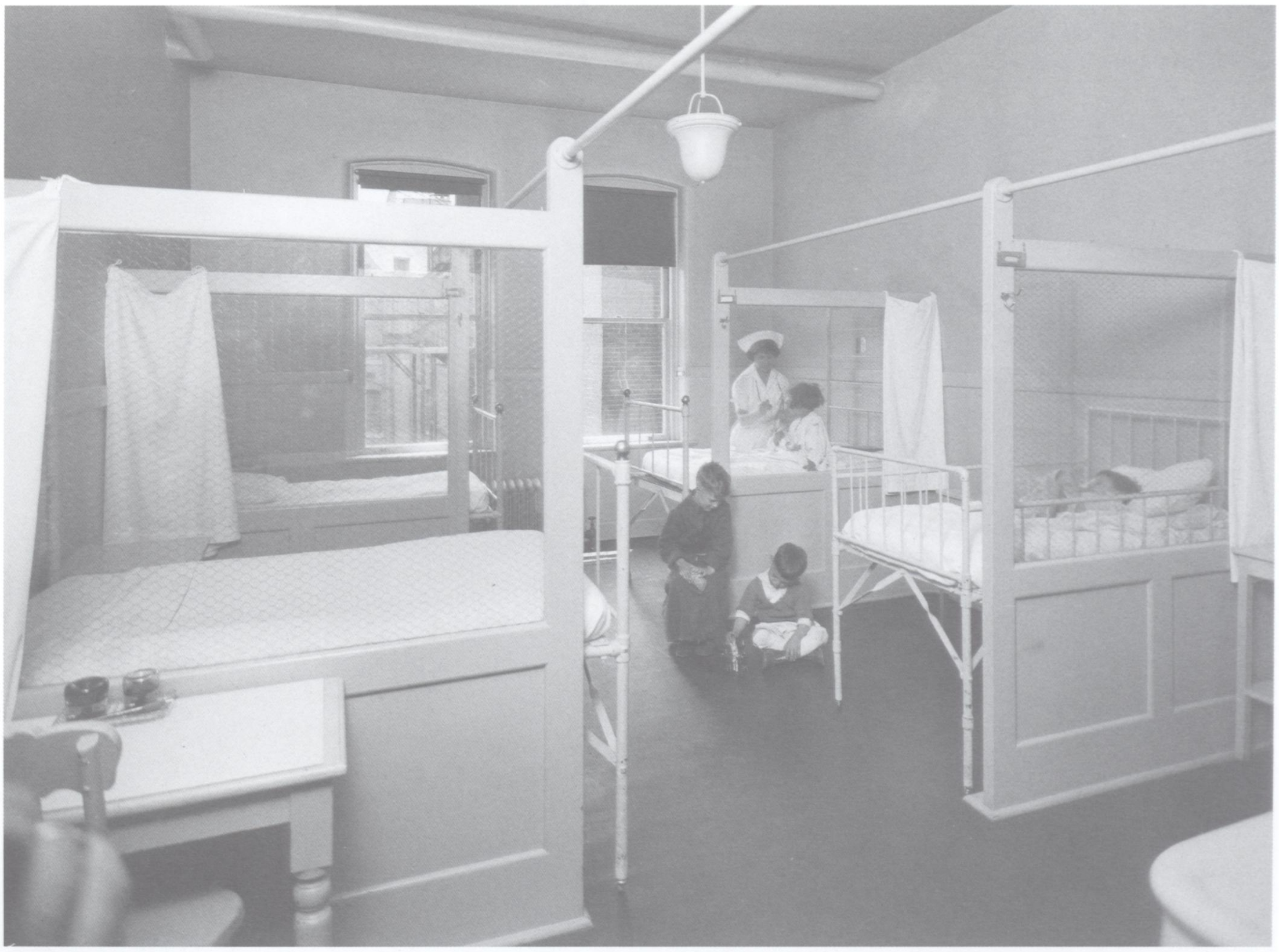
I must tell you, however, that even today, Flexner's criteria are only partially met by medical schools and colleges around the nation. Many remain quite far from their major teaching hospitals and separate from their parent universities. Stanford's School of Medicine, for its part, took decades to meet the Flexner Report's standards. For its first 50 years, like many other medical schools, it was physically removed from the university and, while it excelled in delivering clinical care, it lacked a deep, institutional commitment to scientific excellence.

TRANSFORMING STANFORD MEDICAL SCHOOL

Toward the end of the school's first five decades, there was considerable discussion about its future direction. During his tenure as university president, Ray Lyman Wilbur, Stanford's former dean of medicine, launched an unsuccessful endowment campaign to build new medical school facilities in San Francisco. Then, in 1943, Wilbur's successor, President Donald Tresidder, initiated a formal review of university operations. To assess the School of Medicine, he turned to its dean, Loren R. Chandler, who appointed a committee comprising Professors Harold K. Faber, Edwin W. Schultz, and Charles E. Smith. The group, known as the Faber Committee, completed its work in 1946 and, like Wilbur, recommended expanding and modernizing the school's facilities in San Francisco. When Tresidder died suddenly two years later, however, those plans were stalled.

By 1949, when J. E. Wallace Sterling became Stanford's president, the matter of what to do with the medical school was a burning issue. Sterling and the Board of Trustees began assessing long-range scenarios, and on July 15, 1953, the board announced the decision to relocate the entire medical school to

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A nurse tends patients in the children's ward of Stanford University Hospital in San Francisco.

LEVI COOPER LANE AND THE UNION OF COOPER MEDICAL COLLEGE AND STANFORD



LANE MEDICAL ARCHIVES

Dr. Levi Cooper Lane, the nephew of Elias Samuel Cooper and a master anatomist and pathologist, joined his uncle's faculty in 1861 and played a key role in the survival of the medical school.

Upon taking up his position on the faculty, [Levi Cooper] Lane immediately became a source of much needed relief and solace for his Uncle Elias, who was then approaching complete exhaustion from failing health…In the months that followed, Lane found it necessary to assume increasing responsibility for his uncle's affairs, including acceptance of the editorship of the *San Francisco Medical Press* in July 1862. By this time Cooper's illness was terminal, and his death in October at the age of 41 signaled the impending close of the stormy fledgling era of the school. Had not Lane appeared on the scene when he did, there is little doubt that the school would never have recovered from the premature loss of its founder…

Although Dr. Lane was a tireless worker and exceedingly productive, his health was not robust. Dr. Rixford, his surgical associate, noticed that he would from time to time leave the operating room in the midst of an operation and be gone for 10 or 15 minutes. Meanwhile the operating team would ligate small blood vessels and carry on minor parts of the procedure until Dr. Lane would return to complete the work. Dr. Rixford assumed that he had a chronic digestive disorder of some kind. Dr. Lane also suffered greatly from sciatica although few were aware of it…

In the winter of 1901–1902, Dr. Lane's strength began noticeably to fail. Long procedures left him exhausted. It was at this time that Rixford assisted him on his last operation—the removal of a cancerous breast. Dr. Lane grew so weak during the operation that he was finding it difficult to complete the dissection. At one stage he said, "Give me more light, I can't see in the depth." Among the surgical instruments on the tray there was an old pair of scissors he had used for many years. Rixford handed them to him saying, "Use these, Doctor Lane; they have been there so often they would scarcely need light." He smiled, and after the operation held up the scissors and said, "Never cut adhesive plaster with these scissors. That's what Doctor Cooper said to me when he gave them to me 40 years ago." With this casual gesture Dr. Lane passed the baton of surgery to the capable Emmet Rixford who more than anyone else has by his reminiscences preserved the memory of Cooper, Lane and their school.

Dr. Lane reasoned that Cooper Medical College, in uniting with Stanford, would be making an orderly and inevitable transition to university status

In January 1902, during the last weeks of a terminal illness characterized chiefly by progressive exhaustion and anxiety, Dr. Lane… accepted the view that medical schools in the United States were destined, as in Europe, to be integral parts of universities. He saw that the expenses of his College would increase enormously with the appointment of more salaried professors, and it was clear that the tuition of students could not cover the cost of medical education in a modern school. Faced with these realities, Dr. Lane reasoned that Cooper Medical College, in uniting with Stanford, would be making an orderly and inevitable transition to university status, and would henceforth be remembered and respected as the firm foundation upon which the University's medical school was established.

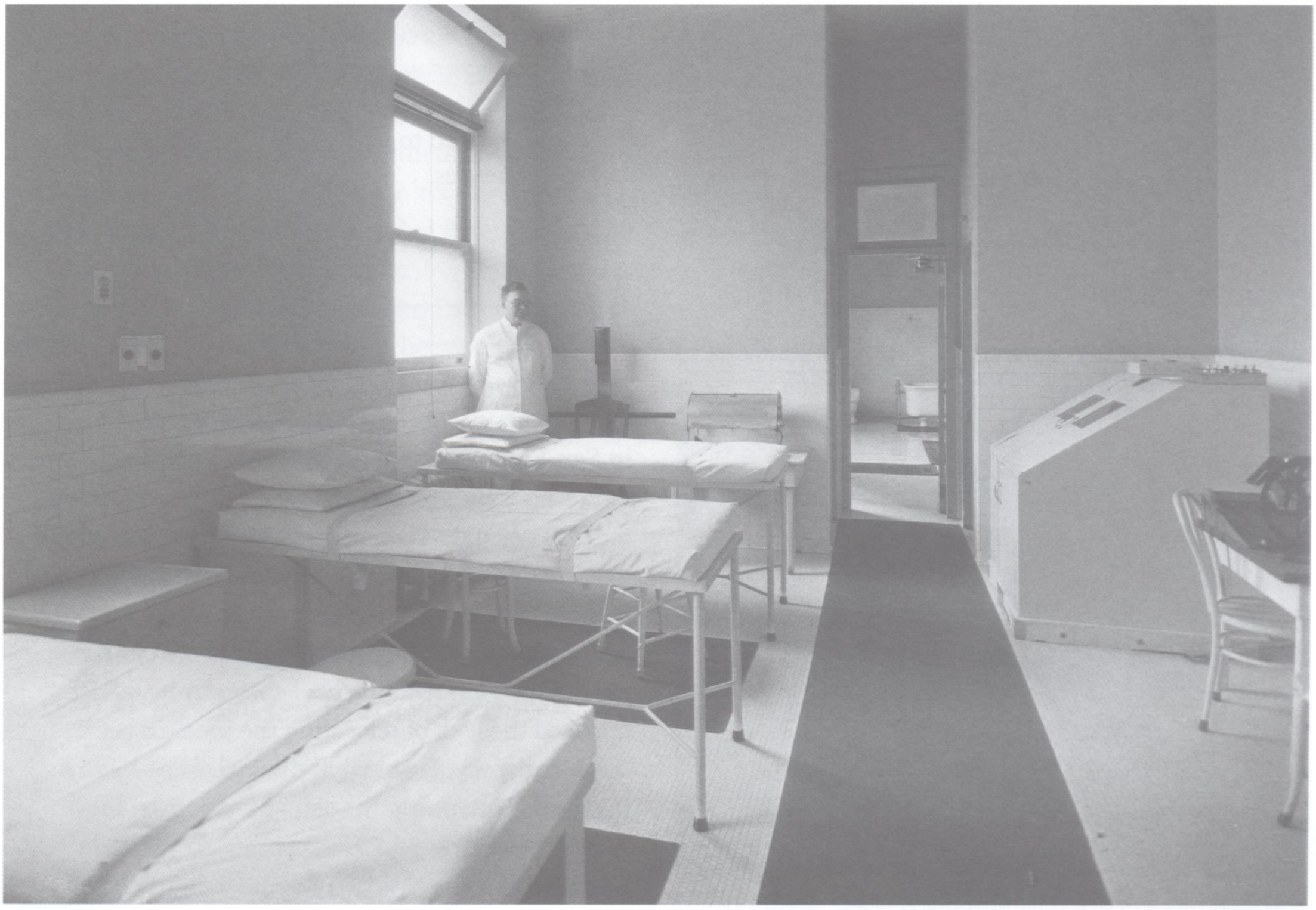
— John L. Wilson

Stanford medical students would no longer split their time between the home campus and Stanford Hospital in San Francisco, and the move would nurture links among Stanford's medical researchers and engineers and basic biological and physical scientists

the Stanford campus. That decision was based on forecasts—by radiologist Henry Kaplan, the father of radiation oncology, and Fred Terman, in the School Engineering—that the next five decades would likely be an era of biology and biosciences, when it would be a significant advantage to have the school of medicine proximate to the university. The decision set the stage for the historical transformation of the School of Medicine.

Now, Stanford medical students would no longer split their time between the home campus and Stanford Hospital in San Francisco. The move would also nurture links among Stanford's medical researchers, engineers, and basic biological and

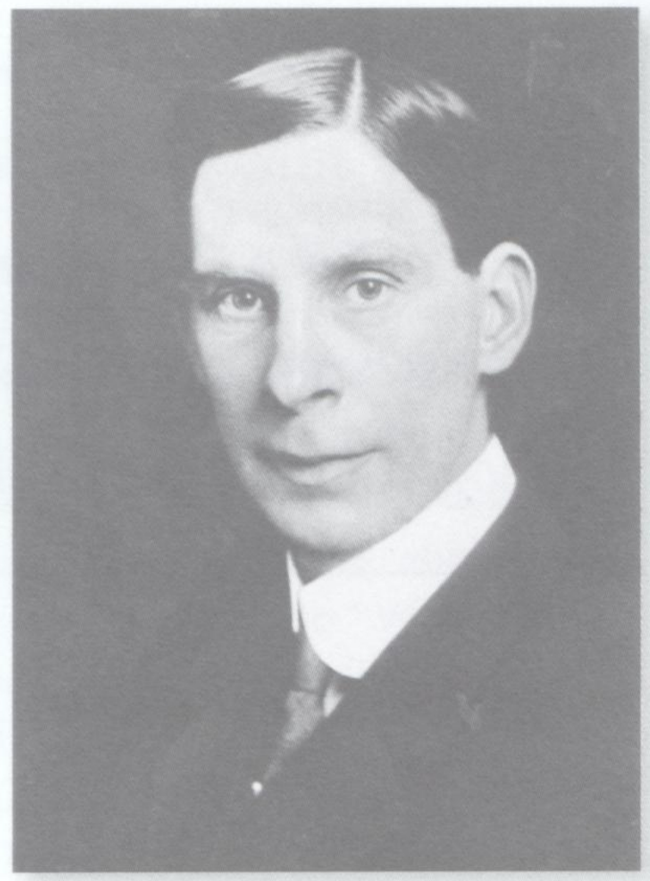
LANE MEDICAL ARCHIVES



The hydrotherapy unit at Stanford Hospital in 1947.

DEAN RAY LYMAN WILBUR, 1911–1916: CHARTING THE MEDICAL SCHOOL'S COURSE

Dr. Wilbur noted in his Memoirs that the first important decision he had to make when he assumed the deanship of the Stanford Medical Department on 1 January 1911 was whether to abandon the Cooper College buildings and move to the campus. The availability of patients for teaching and research was the crucial issue. San Francisco was at the time still recuperating and rebuilding from the great earthquake and fire of 1906, and Dr. Wilbur took many long walks through the neighborhoods between Cooper College and the downtown area in order to assess the emerging patterns of urban recovery. It was clear to him that, with the streetcar systems extending as they were, and with the wooden housing to the east, the College would be adjacent to deteriorating neighborhoods which would be a source of abundant "clinical material." Therefore, it seemed to me," he wrote, "that we could get ahead faster by developing the medical school on the Cooper Medical College site. If, in the course of years, San Francisco eliminated the slum areas, the medical school could be transferred to a new site, perhaps to the University campus. But now," he wisely concluded, "such a move would be premature."



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Ray Lyman Wilbur, president of Stanford from 1916 to 1943, received his M.D. degree from Cooper Medical College in 1899.

He further observed that the campus seemed destined to be the ultimate home for any medical school connected with Stanford University—a prediction fulfilled 48 years later when, in 1959, the school moved to a new Medical Center on the Stanford Campus.

— John L. Wilson

Wilbur observed that the campus seemed destined to be the ultimate home for any medical school connected with Stanford University —a prediction fulfilled 48 years later

physical scientists. A brand-new facility, designed by architect Edward Durell Stone, would create a new model for medical education and research. Following the Flexner recomendations, it would locate the medical school and hospital buildings on the campus of the parent university. To many, that seemed a very attractive opportunity.

RESISTANCE AND REINVENTION

The majority of the medical school's clinical faculty, however—physicians who had been, in their ways, medical pioneers in San Francisco—felt abandoned by the relocation plan. Their work and practices were in San Francisco, and the clinical opportunities in Palo Alto were much less developed than they are today. They didn't seem to have a future under the new model, and they made it clear that if the school moved, they wouldn't come with it. There was also was a great degree of antagonism to the plan on the part of the Palo Alto medical community, which opposed the idea of relocating the medical center here.

Meanwhile, Dean Chandler, who had been involved in planning the school's potential move, retired from that post in 1953 after 20 years, a remarkable tenure. When I came to Stanford in 2001, I was told that the average life of a dean of

the School of Medicine was four years, and I've served for eight so far. Windsor Cutting succeeded Chandler as dean, and it's a bit harder to determine his commitment to the medical school move, except to say that he resigned in 1957 when the plan really began taking shape. The next dean, Robert Alway, was a pediatrician who played a key role—along with Kaplan, Terman, and Sterling—in the next transformation of the School of Medicine, the recruitment of a handful of remarkable individuals.

It began with Arthur Kornberg, who was then chair of microbiology at Washington University in St. Louis. Kornberg, a world-renowned scientist working on the synthesis of DNA, made a pivotal decision; if he was going to move to Stanford, he wanted to bring his entire department of microbiology. Ultimately, Kornberg did move to Stanford, with his five colleagues, because he realized that this was a university that was about to do things differently. Kornberg was very attracted to the entrepreneurial, interdisciplinary environment at Stanford and the fact that there were strong departments here, such as chemistry, that were critical for his work. As it turned out, Kornberg won the Nobel Prize just about the time of the move here in 1959.

Another young faculty member, Paul Berg, came with Kornberg to Stanford in biochemistry. Berg won the Nobel Prize in 1980 and played a very important role in medicine at Stanford. A third stellar recruit was Josh Lederberg, then at the University of Wisconsin, who was recruited to found a new Stanford Department of Genetics. Lederberg, too, won the Nobel Prize within about a year after his appointment.

Suddenly, Stanford had new departments of biochemistry and genetics, and the School of Medicine was transformed from a largely clinical school in San Francisco to an entirely new model on campus, with a brand-new facility considered very novel in those days and a small but remarkable faculty, including two recent Nobel laureates. Other outstanding faculty members included Avram Goldstein, who had been the head of pharmacology in San Francisco; Norm Kretchmer, head of

The majority of the medical school's clinical faculty felt abandoned by the relocation plan...they made it clear that if the school moved, they wouldn't come with it

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Dean Loren R. "Yank" Chandler helped plan the move of Stanford Medical School to the main campus.

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Biochemist Paul Berg, shown here in 1970, joined the medical school faculty in 1959 and won the Nobel Prize for Chemistry in 1980.

pediatrics, who was one of the most renowned figures in pediatrics in the world; Hal Holman, who was recruited from Rockefeller University to found Stanford's Department of Medicine; and David Hamburg, who founded Stanford's Department of Psychiatry and made extraordinary contributions to that field. Stanford became one of the leading medical schools in the country, virtually overnight, because of its unique combination of people, facilities, and vision. And part of that vision was an innovative concept of how to educate medical students.

THE FIVE-YEAR PLAN

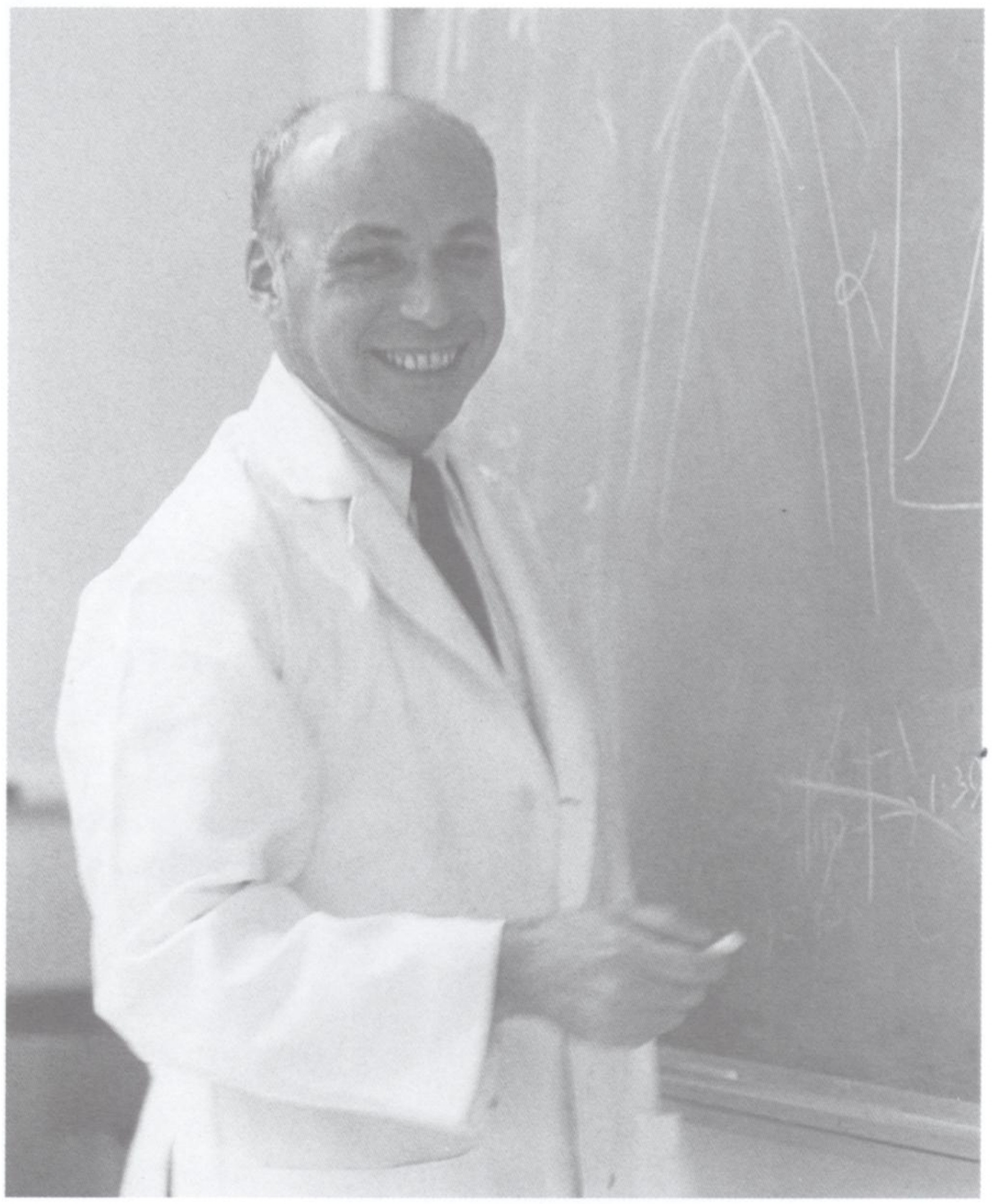
Traditionally, medical students first went to college and earned a bachelor's degree. They then did two years of preclinical sciences—courses like anatomy, biochemistry, microbiology, and pharmacology—followed by two years of apprenticeship learning in clinical services. After they earned their M.D. degrees, they did additional training, generally for three to ten years, in residency and post-residency programs. Stanford, however, decided to formulate a different approach to medical education, known as the Five-Year Plan. The Stanford School of Medicine decided to admit students after only three years of college, not four, before they had graduated and earned their bachelor's degrees. Students would then spend five years here and complete the rest of their undergraduate work in university courses on the Stanford campus. The Flexner Report had argued that medical students should acquire skills in basic science as well as clinical medicine, and Stanford's concept was to follow that model by teaching and training students to do hands-on, directed, parallel thinking in science and medicine.

As it turned out, however, the Five-Year Plan barely existed for five years. During the rebellious years of the 1960s, students successfully lobbied for curricular reform. But the Five-Year Plan became a cultural icon in medical education. It also had a huge effect on Stanford medicine for the next 50 years, because it defined medical education as preparing physician scientists and leaders. In my view, Stanford Medical School is world-renowned today because of its excellence in science and novel approaches to medical education.

Under the Five-Year Plan, the Stanford School of Medicine decided to admit students after only three years of college, not four, before they had graduated and earned their bachelor's degrees

Still, I'll confess that when I was about to join the faculty here, eight years ago, a colleague back East said to me, "Well, Stanford Medicine"—and he really meant clinical medicine—"looks a lot better the further you are away from it." What he meant to say was, Stanford's reputation was strong, but the quality of its clinical programs was not as outstanding as the quality of its science. For the first two decades after the medical school moved to campus, I think

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Norman Kretchmer (1923–1995) was recruited by Stanford Medical School in 1959 as chair of the Department of Pediatrics.

that was true. Stanford was deeply committed to excellence in science, and that became the metric that defined almost everything. Two years ago, in fact, we sampled our medical school faculty in a survey and asked, "What are the values that are most esteemed at Stanford?" The answer that got the highest marks, by far, was research. Education and clinical care, they felt, didn't get quite that same degree of emphasis, because research has been the culture of the realm at Stanford Medical School, certainly since its second inception in 1959. That fact has had a huge impact on the way the school has been organized, the way it has articulated programs, and the way it has achieved results.

RECONNECTING WITH HISTORY

As often happens, of course, we're rediscovering our past to define our future. Our new curriculum has most students spending five or more years at Stanford Medical School, and all of them are engaged in scholarship and research. Under the broad banner of bringing science from the laboratory to the patient, Stanford medical education today is, in many ways, predicated on the historical, visionary approach of training physician scientists that Stanford practiced at the end of the 1950s.

Today, Stanford medicine is viewed around the world as a remarkably successful enterprise because of its co-location with Stanford University and the interdisciplinary research that it affords, particularly between the physical and medical sciences. That cross-fertilization has been absolutely characteristic of Stanford medicine and has made this a unique institution. Henry Kaplan, who facilitated the school's move to the main campus, did his most fundamentally important work because he collaborated with physicist Edward Ginzton, who invented the linear accelerator, a technology that has had a huge impact on oncology and applied physics. Leonard and Leonore Herzenberg, other early members of the Stanford medical community, worked with Stanford engineers to develop the fluorescent-activated cell sorter, a device that became critical 20 years later in HIV research and treatment.

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David Hamburg founded Stanford's Department of Psychiatry and Behavioral Sciences in 1961.

INTENSIVE MEDICAL TRAINING DURING WORLD WAR II

Shortly after the Declaration of War against Japan on December 8, 1941, the medical schools went on a continuous teaching program known as the 9-9-9 Medical Plan. This meant that Stanford Medical School opened its regular classes in September, 1941, continued for the nine months ending on a Friday afternoon in June, 1942, but the following Monday the next academic year was begun. This continued throughout the period of war and, during the four years, five classes were graduated from the medical school.

Approximately 35 percent of the Stanford Medical Faculty were on military leaves of absence, many of them serving in Army Evacuation Hospital No. 59 in the European theater during the war. The staff of this special unit was composed of members of the staff of the San Francisco Hospital; all but four were members of the Stanford University Medical Faculty or the Stanford resident staff. This Evacuation Hospital made an outstanding record in the European theater. The report of its accomplishments, the number of patients cared for, the low mortality rate of the large number of patients cleared through the hospital was the subject of a laudatory special Report by the Historical Division, Office of the Surgeon General, U. S. Army.

— John L. Wilson



STANFORD UNIVERSITY ARCHIVES

Since the U.S. military had an urgent need for physicians, the Stanford Medical School launched the 9-9-9 Medical Plan, teaching students for nine consecutive months and graduating five classes in just four years.

One of the most extraordinary and remarkable achievements here has been the real willingness on the part of faculty to engage in this kind of interschool, interdisciplinary work.

At the medical school, we are actively fostering those collaborations. We now have joint degree programs for our M.D. students with all six other schools at Stanford, affording vast opportunities for interdisciplinary training. We've also established a new program for Stanford science Ph.D. students, called the Masters of Medicine Program, which educates them in clinical medicine, facilitating the translation of basic science to the patient bedside. And we've developed the Stanford Institutes of Medicine, which engage faculty in each of the schools throughout the university in programs ranging from stem cell biology to cancer and the neurosciences. Our ability to bring knowledge from the laboratory to the patient is directly proportional to the close connection between our hospitals and clinics and the research facilities that distinguish the School of Medicine and the university.

Fifty years after the move to Palo Alto, and 100 years after the schools' founding, Stanford medicine, I think, is sharply focusing on its defining principles. Our challenge today is to build on the past and create a future in which Stanford medicine looms large 50 and 100 years from now, continuing to transform health care, medicine, science, and the university itself.